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Description**Technical Field**

The invention relates to the field of coin-operated amusement and gaming machine systems and in particular to systems for transferring data to and from such game machines.

Background

For several years, the automation of accounting and security functions having to do with coin-operated gaming machines has been shown to be a desirable and cost-effective method of obtaining accurate and timely data concerning the operation of these machines. In recent years, the automated accumulation of data concerning individual players, either in conjunction with the accounting and security information or without it, has also shown itself to be desirable as an effective marketing technique. Treating players in much the same manner as the airlines treat members of their "frequent flyer" clubs, game machine proprietors can, by keeping an accounting of the amount a player spends in their establishment, reward the patron accordingly. Also, by enrolling the player as a "preferred customer," the establishment can obtain a name and address, as well as certain other biographical and demographic data which is useful in the maintaining of a mailing list and other marketing efforts. There are also instances wherein the use of a player-carried device such as a magnetic-stripe card such as the card shown in U. S. patent 4,575,622 can be used to enable players to use coin-operated game devices by paying a lump sum in lieu of using individual coins. In these cases, the card is the means of identifying the player, while the actual accounting of play takes place in a central computer electronically connected to the gaming machines.

Another important function of gaming machine data transfer systems is to provide accounting and security information to casino operators. Most of these applications have in the past required the gaming machines to be directly connected to the central computer. Examples of such gaming machine data transfer systems are provided in U. S. patents 4,072,930, 4,283,709, 4,575,622 and 4,636,951. This usually entails a large computer equipment installation, and the installation of an extensive network of data communication cables and associated equipment. And, since the central computer is usually connected to a large number of gaming machines, in some cases up to 2000 or more machines in a real time data communication configuration, a powerful and hence expensive central computer is required. Another disadvantage of these systems arises from the fact that the distance that the data can be transmitted is usually, as a practical matter, limited, thus the central computer

is usually restricted to the same premises as the gaming machines. As a result, these electronic gaming machine information systems tend to be limited to gaming operations where a relatively large number of machines are located in close proximity to each other.

5 One approach to solving these problems was attempted in the SDS V system developed by Bally Systems Division of Bally Manufacturing Corporation in which a portable data recording unit having a microprocessor and limited semiconductor memory was used to collect data from slot machines. The data thus collected by an employee of the machine owner was transferred to a central data system when the recording unit was connected to a data input device in the central system. However, this approach suffered from a number of deficiencies including limitations in the type and amounts of data that could be collected, no capability to collect player information and no ability to transfer information to the slot machine.

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The Invention

25 The invention provides a data transfer system for use with a plurality of game machines comprising a plurality of portable data units for carrying by players or employees, each portable data unit comprising a data memory containing player account information relevant to its associated player; an interface unit incorporated into each game machine for receiving the portable data unit carried by a player or employee and for reading from the data memory of that portable data unit player information; and a central data processor for receiving the portable data unit carried by a player and reading therefrom the player information, characterised in that each interface unit includes means for transmitting to the data memory of a portable data unit received therein machine data; each portable data unit or each interface unit further comprises a processor for recording machine data in the data memory of a portable data unit received in an interface unit of a game machine and for modifying player information stored in the said data memory in response to selected machine data transmitted to the portable data unit by the interface unit in which it is received; and the central data processor further includes means for reading from a portable data unit inserted therein machine data relating to the game machines with which the portable data unit has been used.

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45 The processor may be associated with either the portable data unit or the interface unit, but preferably each such unit has its own processor, the processors cooperating in the transfer of data to and from the portable data units, the game machines and the central data processor and modifying the player information stored in the data memories of the portable data units in response to the selected machine data information transmitted to the portable data units from the

interface units to which they are connected.

The game machines may be gambling machines, otherwise known as gaming machines, which pay out winnings to successful players; or they may be amusement machines such as video games. In the former case the winnings may be paid out in the usual way in coins by the machine or may be simply recorded on the portable data unit for encashment later when the portable data unit is presented to a cashier who inserts it into the central data processor to read the information stored thereon.

The exchange of information between the portable data units and the game machines via their interfaces according to the invention is essentially a two-way exchange. The game machine, through its interface, reads from the portable data unit player information including, preferably, player account information. It writes to the portable data unit machine information and modifies the player information so that when the portable data unit is subsequently presented to the central data processor the processor can obtain a range of information concerning player activity and game machine performance.

Each player or employee may thus carry a portable data unit that will permit the transmittal of player information and game machine information between game machines and a central data system. The data unit may also contain player account and win information. Machine identification and performance information can be transmitted and stored in the central data processor.

The portable data unit is typically a smart card, which is a device generally the shape and size of a standard credit card, which contains solid-state memory, as well as circuitry to enable the memory to be written to, read from and otherwise manipulated. Examples of such devices are disclosed in U.S. Patents 4,675,516, 4,725,924, 4,727,246, 4,733,061 and 4,764,666.

A very significant advantage of the invention is that a large central computer can be replaced by a minicomputer, or in some cases by one or more desktop personal computers. Since the need for real-time on-line communication with all the game machines does not exist, the data processing functions can be handled easily by the small computer system. Since the communication of data from the game machines to the computer system is not limited by a network of data communication cables, game machines need not to be on the same premises as, or even in the near vicinity of, the computer.

The elimination of the data communication hardware and the large central computer makes possible the automation of the accounting, security, and player tracking functions even for small establishments, and to operators that have small numbers or widely dispersed gaming machines which could not otherwise justify the cost of such a system.

Drawings

- FIG. 1 is a perspective view of a gaming machine;
 FIG. 2 is a partially cut away perspective view of
 a portable data transfer unit, being part of a sys-
 tem according to the invention;
 FIG. 3 is a functional block diagram of a gaming
 machine interface circuit for use with the data
 transfer unit of FIG. 2, along with a portion of the
 gaming machine circuitry;
 FIG. 4 is a functional block diagram of a central
 data processing system for use with the data
 transfer unit of FIG. 2;
 FIG. 5 is a diagram of memory organization for a
 player data transfer unit as in FIG. 2;
 FIG. 6 is a diagram of memory organization for a
 machine data transfer unit as in FIG. 2; and
 FIG. 7 is a diagram of a down load data transfer
 unit as in FIG. 2.

Best Mode

In FIG. 1 is provided a view of a typical gaming machine 10. The machine 10 as represented in FIG. 1 is a slot machine which in normal operation accepts a coin or token in a slot 12 and responds to a pull on a handle 14 by a player by depositing one or more coins in a coin tray 16 if a winning play is registered. A win or lose indication is provided to the player by a display 18 that in a slot machine normally takes the form of a group of mechanical reels or a video display. Although the gaming machine 10 shown in FIG. 1 is a slot machine, it should be understood that the invention can be equally applied to a wide variety of casino-type gaming machines including video poker and Black Jack machines as well as other coin operated amusement games.

FIG. 2 provides a partially cut away view of the preferred embodiment of a portable data transfer unit 20. The data unit 20 includes a microprocessor 22 connected by data lines 24 to a number of non-volatile random access semiconductor memories 26. Microprocessor 22 is connected to an interface circuit 28 by a group of data and control lines indicated generally at 30. Communication to external devices is facilitated by a group of contacts 32 connected to the interface circuit 28. Preferably, these contacts conform to an industry standard such as ISO/DIS 78161/1 and 78161/2 and include contacts for: chip select signals; clock input signals; a data input signal; a data output signal; a power supply input; a status input signal, a ground line and a memory type signal.

The circuit elements 22, 26 and 28 can in effect function as a small computer system by, for example: accepting data and control signals from external devices connected to contacts 32; using the microprocessor 22 to process the data; reading and writing data into memory 26 and transmitting data and con-

trol signals via the interface circuit 28 to the external devices.

In the embodiment of FIG. 2, the circuit elements 22, 26 and 28 are mounted on a bottom sheet 34 and covered or sealed within the unit 20 by a cover sheet 36 with a portion 38 left open to provide access to the contacts 32. Preferably the data unit 20 has outer dimensions that correspond to a standard credit card. Examples of various types of structures that can be used for the portable data unit 20 are shown in U. S. patents 4,725,924, 4,727,246, 4,733,061 and 4,764,666.

Although the preferred embodiment of the portable data unit 20 has been described above in terms of an IC card or smart card, other configurations or structures that provide a data memory along with a data processing capability arranged in a conveniently portable package could serve as well.

Use of the data unit 20 with the gaming machine 10 is facilitated by an interface unit 40 secured within the housing of the gaming machine 10 as shown in FIG. 3. Although the preferred embodiment of the invention in FIG. 1 shows the interface unit 40 secured within the machine 10, the machine 10 can also include the interface unit 40 by attaching it as a separate unit to the exterior of the machine's 10 housing. A read/write circuit 42 receives the data unit 20 via a slot 44 configured in the housing of the gaming machine 10. The read/write circuit 42 contains contacts corresponding to the contacts 32 of the data unit 20 along with conventional signal interface and buffering circuitry. Additionally included in the interface unit is a microprocessor 46 connected to the read/write circuit 42 by data and control lines represented by a line 48 and a random access memory 50 along with a read only memory 52 that contains control instructions for the processor 46. A clock-calendar circuit 53 is also connected to the processor 46.

Since the preferred embodiment of the invention is described within the context of a microprocessor based slot machine 10, the interface unit 40 also includes a machine element interface circuit 54 and a machine processor interface circuit 56 connected to the processor 46 by data and control lines represented by lines 58 and 60 respectively. The slot machine 10 includes, as shown in FIG. 3, a microprocessor 62 that communicates with the machine processor interface 56 via a data bus 64. As is conventional with microprocessor based gaming machines including video poker and other types of gaming machines, the microprocessor 62 controls the operation of the machine 10. Slot machines of the type shown in FIG. 3 also have a number of discrete signal sources that represent the status of the machine. Representative examples of status signals generated in the slot machine 10 are: drop door status 66, slot door status 68, a coin in signal 70, a coin out signal 72 and a handle pull signal 74. The signal sources 66-74 are connect-

ed to the machine element interface 54 by a series of lines represented for simplicity by a single line 76.

The preferred embodiment of the interface unit 40 additionally includes a display 78 which is connected to the microprocessor 46 by a conventional set of data, address and control lines as represented by a line 80.

Also, as illustrated FIG. 4, the data transfer system includes a central data processor 82 to perform general casino accounting functions and which receives the data unit 20 in a system interface circuit 84. The system interface circuit 84 includes contacts and a read/write circuit (not shown) which is similar in operation to the read/write circuit 42 of FIG. 3. The system of FIG. 4 can also have one or more data input terminals 86 and displays 88. Depending upon circumstances such as the number and locations of gaming machines 10 and the functions to be performed by the central data processing system of FIG. 4, the preferred embodiment of the hardware arrangement will vary. For example, in some instances where a large number of machines 10 are being administered in a centralized accounting system the central data processor 82 would be a minicomputer with one or more terminals 86 directly connected to the computer 82 in the same location. On the other hand, where a fewer number of gaming machines 10 are to be administered or a more decentralized accounting system is used, one or more personal computers can be used for the data processor 82, terminal 86 and display 88. Where it is desired to use more than one personal computer to perform the functions of the system of FIG. 4, and it is considered important to maintain centralized control of the gaming data and transactions, a data communication network such as a local area network can be used to operatively tie the computers 82 together.

In any event, the system as illustrated in FIGS. 1-4 provides substantially enhanced flexibility along with increased operational capabilities in a gaming machine data and control system while at the same time reduces hardware requirements and costs.

Operation of the system of FIGS. 1-4 will now be described in connection with the memory diagrams of FIGS. 5-7. With reference to FIG. 5 which illustrates the data organization in the memory 26 in a first embodiment 90 of the portable data unit 20 of FIG. 2 for use by a player, the data unit or card 20 at the time that it is first issued to a player by a casino or game operator is inserted into the system interface 84 of the central system of FIG. 4. At this point the various data fields in the memory 90 are initialized.

A first field 92 is loaded with data indicating the type of card and an identification number for that particular card 20. As will be described below, there are a number of different types of cards 20 that can be employed by this system. At this time data identifying the player is also written into a data field 94. This in-

formation is particularly important due to the fact that many casinos base their marketing programs around the amount of activity of individual players or customers and as such it is very useful to be able to track the amount of play activity of each player. In this manner, for example, premiums and bonuses can be awarded to particularly active players thereby encouraging further play on the part of the individual. In addition, this information can be used to compile lists of preferred customers which is useful from a marketing standpoint.

Another data field 96 can be used to store casino or card data such as an identification of the casino, the location of the issuing system, player account number and the number of times that the particular card 20 has been used.

In the event that the card 20 is to be used as a debit or a credit card to play the gaming machines 10, that information is loaded into a debit/credit field 98 by a casino employee using the terminal 86. If the card 20 is used as a debit card the employee accepts payment and loads the appropriate monetary value in the field 98 or if the card 20 is to be used as a credit card, the employee authorizes the amount of credit that the particular player is entitled to and loads that amount into field 98. By the same token, the information in the field 98 can be used by the casino employee using terminal 86 to pay or credit the player when the card is redeemed or presented for payment.

Since security is an extremely important consideration in casino operations, the memory 90 can also include an encryption data field 100 which can contain encryption keys or algorithms. As will be described in more detail later, the data in field 100 can be used by the interface unit 40 to ensure that the card 20 is an authorized card. Also the data in the other fields of the memory 90 can be encrypted such as the debit/credit field 98 in order for example to discourage players from taking the card 20 home to increase on their own the value of the credits in that field.

After the player card 20 having memory organization 90 is initialized, it is ready for use with the gaming machine 10. The player will insert the card 20 into the read/write circuit 42 of the interface unit 40 as shown in FIG. 3 via slot 44. The read/write circuit 42 is under the control of the microprocessor 46 and causes this circuit 42 to transmit to the microprocessor 22 on the card 20 the appropriate instructions so that the identifying data in fields 92 and 94 are transmitted to the processor 46. Depending upon the level of security desired the processor can also access encryption keys or passwords from field 100 to use with an encryption algorithm or password procedure stored for example in ROM 52 to determine if the card 20 is authorized. The information stored in field 100 can additionally include access control codes and codes defining the functions and access capabilities of the card 20. Alternatively the card microprocessor 22 can

encrypt using, for example, one of the NBS encryption standards the data being transmitted to the processor 46 and the processor 46 can in turn use a matching algorithm to decrypt the data.

Once the card 20 has established communication with the interface unit 40 and been identified as a player type card, the interface unit 40 will make available to the gaming machine 10 the debit or credit information contained in data field 98. In the embodiment shown in FIG. 3, this information is transmitted by way of the machine interface 56 to the gaming machine microprocessor 62. In gaming machines of this type the player has the option of selecting by means of a control button or switch indicated at 101 on the machine housing 10, credit or coin operation.

One of the more significant features of the invention is a comprehensive player tracking capability. As the player operates the machine 10, data representing game play is transmitted by the interface unit to the memory 90 of the card 20. For example, the identification of the machine 10 being played is stored in a data field 104 as shown in FIG. 5. In the preferred embodiment of the invention the identification of the last ten machines 10 played are stored in fields 104. In addition, specific information relating to the games played is also stored in card memory 90. In the embodiment shown in FIG. 5, eight data fields indicated generally at 106 are provided to store information relating to player activity. Here, there is one field 106 for each denomination: nickel, dime, quarter, half-dollar, dollar, \$5, \$25 and \$100. Within each field 106 there is a group of subfields for storing the number of coins played 108, coins paid out 110, the number of games played 112 and the number of coins paid by attendants 114 for each denomination. Also, the time of play in minutes for that denomination is stored in a subfield 116. It will be understood, of course, that the amount and types of data stored in the game play fields such as 106 of memory 90 can be varied to suit a particular casino operating environment. In addition to the play data discussed above the memory 90 contains a data field 118 to store information relating to the jackpots or other major prizes won by the players.

In the preferred embodiment of the invention, the interface unit 40 performs the calculations necessary to compute the players bonus or premium award status and stores that status in a bonus data field 102 in the card memory 90. The bonus status can be based on a wide variety of information and criteria such as the number of games or time the machine 10 is played as received from the machine processor 62 along with other data obtained from the card memory 90. For example, player bonus status can be calculated on the player's "volume of play" which can include one or more of the following factors: coins played, number of handle pulls, amount won, length of time played, payouts, length of time played without a win, etc. Use of the processor 46 in the interface unit 40 to perform

this function has a number of advantages including immediate access to relevant information about the individual player and a complete operational separation and non-interference with the operation of the gaming machine 10.

The use of the card or data transfer unit 20 enhances the data gathering ability of the gaming machine data transfer system when the player redeems the card 20. Typically the player will hand the card 20 to a casino employee who will insert the card 20 into the system interface 84 of the central data system of FIG. 4. Upon receiving and verifying the data from card 20 the central data processor 82 can, either automatically or at the request of an employee operating the terminal 86, clear selected portions of memory 90, thus preparing the card 20 for future data collection. The system of FIG. 4 can also display on display 88 or print out reports on information and calculations based on the data thus collected. At this point the player, based on the data displayed, can receive payment or credit derived from the information on the card 20. In particular, the player's individual account status is printed out or displayed on display 88 so that the casino employee can determine what prizes, premiums or awards that the player may be entitled to. If such awards are made by the employee, this information is entered into the system of FIG. 4 via the terminal 86 resulting in a decrementing of the bonus data in field 102 of card memory 90. As with the interface unit 40, it is the system interface 84, which is functionally similar in construction to interface 40, that actually performs the reading from, writing to and clearing of card memory 90.

Cashless gaming is also facilitated by use of the card 20 in combination with the system of FIGS. 3 and 4. When the player is issued a card 20 or presents a previously issued card 20 a casino employee, the employee will insert the card 20 into the system interface 84 and by using the terminal 86 updates the debit or credit balance in field 98 of card memory 90. Upon receipt of the card 20 in interface unit 40, the processor 46 first verifies that there is sufficient value in field 98 to play the machine 10 and then via machine processor interface circuit 56 enables the machine 10 for credit play. The player by utilizing the machine control button 101 can select normal payouts via the coin tray 16 or to have the balance on field 98 reflect his winnings. Win data if the option is selected, is transmitted from the machine processor 62 through the interface unit 40 to data field 98. The credit or debit status, which can be termed account status, as reflected in field 98 is provided to the player by the display 78 which is controlled by the processor 46.

A related feature of the interface unit 40 is the ability to provide information on the display 78 in addition to the player's debit or credit balance. For example, using the data stored in memory 90, the processor 46 can display the player's name in a person-

alized welcoming message along with other player specific information such as any bonuses or prizes he may be entitled to as indicated in data field 102.

5 The use of the portable data transfer unit 20 has a number of very significant advantages in collecting data regarding gaming machine operation and security as well. As shown in FIG. 6, a portion 120 of the card memory 26 can be configured to collect data relating to machine operation. Although the memory 10
10 120 as shown in FIG. 6 is structured for a particular type of card 20, it should be understood that the data organization could be incorporated into other types of cards such as the player card 20 of FIG. 5. For purposes of this description the data fields in FIGS. 5-7
15 that contain similar types of data will have the same reference numerals.

With respect to FIG. 6, if the card 20 containing memory 120 is an employee issued card 20, data field 92 will reflect that fact and data field 94 will contain the employee's identification. In the embodiment of the memory organization 120, shown in FIG. 6, there are a group of data fields indicated at 122 each of which corresponds to a particular gaming machine 10. The data fields 122 are each divided into a number of subfields. When the card 20 is inserted into the interface unit 40 the processor 46 will write the gaming machine identification in a first subfield 124. During normal operation of the gaming machine 10 accounting and security data is transmitted via the machine element interface 54 and the processor interface circuit 56 to the interface processor 46 and stored in the memory 50. Preferably this data is time and date stamped by the processor 46. After the card 20 has been verified by processor 46 and the machine identification stored in the subfield 124, the processor 46 will write machine accounting information such as:
20 the number of coins played into a subfield 126; the number of coins in the gaming machine 10 cash box into a subfield 128; the number of coins paid out by the machine 10 into a subfield 130; the number of games played for card-type gaming machines 10 or handle pulls for slot type gaming machines 10 into a subfield 132 and the number of coins paid by attendants to players into a subfield 134. Similarly, security information such as the number of gaming machine door openings will be written into a subfield 136; the number of coin hopper jams will be written into a subfield 138 and the number of blackouts, that is interruptions of electrical power to the machine 10, will be written into a subfield 140. Also, the last ten security events such as tilts and illegal pays recorded in the memory 50 will be written into a subfield 142. Along with the data as described above appropriate date-time information corresponding to the data will be written into the subfields 126-142 as well. It should be noted that the use of a separate processor 46 and memory 50 in the interface unit 40 makes possible a particular convenient method of gathering and retain-
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ing time information which can be very useful from a security standpoint. As with the player data unit 20 having data memory organisation 90, the employee card 20 having data memory organization 120 would be inserted into the system interface 84 and the machine data transferred from the card 20 to the central data processor 82.

As indicated above, the memory 26 of the data transfer unit 20 can store various types of player and machine data. For example, it would be possible to include portions of the data memory organization 120 in the data memory organization 90 of the player card 20. In this manner the players would collect at least a portion of the machine information of FIG. 6 in the course of playing the gaming machine 10. This could reduce the need for casino employees to make regular checks of the status and performance of the gaming machines 10 and provide more current information with respect to at least the more heavily patronized machines 10.

A third type of data memory organization 144 for use with the data transfer unit 20 is illustrated in FIG. 7. The cards 20 having this type of data would be used by casino employees for down loading control programs and data to the gaming machine 10 and interface unit 40. Examples of such control instructions and data include control instructions for the interface unit processor 46 stored in a field 146 and player messages for use with the display 78 stored in a field 148. Updates for the interface units 40 encryption/decryption keys and passwords can be stored in a data field 150 and revised encryption algorithms for use by the processor 46 can be stored in a data field 152. A data field 154 can contain new or revised computer programs for controlling the gaming machine processor 62 along with control variables that the processor 62 employs, for example, in setting the win percentage of the gaming machine 10. The data in memory 144 can also include a field 156 storing formulas used by the interface unit processor 46 to calculate the player bonus or premiums.

Also shown in FIG. 7 is a field 158 for storing card use data. This data is written into field 158 by the interface unit 40 each time the card 20 is used with a gaming machine 10 and as such provides the central data system of FIG. 4 and hence casino management with valuable information regarding card usage. Although not shown in FIGS. 5 and 6 it is considered desirable in the preferred embodiment of the invention to include a similar data field in the player card memory 90 and the machine data memory 120.

From the above discussion it is apparent that the use of the portable data unit or card 20 having a data processing capability in combination with computer controlled gaming machine interface units 40 provides a gaming machine information transfer system of great flexibility and low cost with the ability to generate useful information for casino management. Al-

though the invention has been described in terms of its use with gaming machines 10 that return money to the player, such as slot machines or video poker machines, many of the aspects of the invention would apply to coin-operated amusement type games as well. Thus, certain aspects of the invention relate to game machines 10 in general which include gaming machines along with amusement games.

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Claims

1. A data transfer system for use with a plurality of game machines (10) comprising:
 - a plurality of portable data units (20) for carrying by players, each portable data unit (20) comprising a data memory (26) containing player account information relevant to its associated player;
 - an interface unit (40) incorporated into each game machine (10) for receiving the portable data unit (20) carried by a player and for reading from the data memory (26) of that portable data unit (20) player information; and
 - 25 a central data processor (82) for receiving the portable data unit (20) carried by a player and reading therefrom the player information, CHARACTERISED IN THAT
 - each interface unit (40) includes means for transmitting to the data memory (26) of a portable data unit (20) received therein machine data;
 - each portable data unit (20) or each interface unit (40) further comprises a processor (22 or 46) for recording machine data in the data memory (26) of a portable data unit (20) received in an interface unit (40) of a game machine (10) and for modifying player information stored in the said data memory (26) in response to selected machine data transmitted to the portable data unit (20) by the interface unit (40) in which it is received; and
 - 40 the central data processor (82) further includes means for reading from a portable data unit (20) inserted therein machine data relating to the game machines (10) with which the portable data unit (20) has been used.
2. A system according to claim 1, wherein each portable data unit (20) comprises a processor (22) for modifying the player information stored in the data memory (26) of the portable data unit (20) when received in an interface unit (40) in response to the selected machine data transmitted to the portable data unit (20) by the interface unit (40).
3. A system according to claim 1, wherein each interface unit (40) comprises a processor (46) for

- modifying the player information stored in the data memory (26) of a portable data unit (20) inserted therein, in response to the selected machine data transmitted to the portable data unit (20) from the interface unit (40). 5
4. A system according to claim 1, wherein each portable data unit (20) comprises a processor (22) and each interface unit (40) comprises a processor (46), the processors (22, 46) cooperating to modify the player information stored in the data memory (26) of a portable data unit (20) received in an interface unit (40) in response to the selected machine data transmitted to the portable data unit (20) by the interface unit (40). 10
5. A system according to any preceding claim, in which the data memory (26) is a non-volatile random access memory. 15
6. A system according to any preceding claim, in which the interface units (40) are included within the outer housings of the game machines (10). 20
7. A system according to any preceding claim, in which both the interface units (40) and the data unit (20) comprise means for encrypting data transmitted to the portable data unit (20) and means for decrypting data transmitted from the portable data units (20). 25
8. A system according to any preceding claim, in which each interface unit (40) includes means for adding date and time information to the selected data. 30
9. A system according to any preceding claim, in which each interface unit (40) additionally includes a display (78) for displaying player information from a portable data unit (20) inserted therein. 35
10. A system according to any preceding claim, in which each portable data unit (20) has outer dimensions that correspond to a standard credit card. 40
11. A system according to any preceding claim, wherein each portable data unit (20) has a separate memory or memory area (26) configured to receive player information, play information and machine data. 45
12. A system according to claim 11, wherein the play information includes player account information including separate fields to identify, for each denomination of currency acceptable to the game machine, the number of games played, the amount of any winnings, the number of coins or tokens inserted into the game machine while the portable data unit (20) is inserted therein and the time played. 50
- Patentansprüche**
1. Datenübertragungssystem zur Benutzung mit einer Vielzahl von Spielautomaten (10) mit einer Vielzahl von tragbaren Datengeräten (20) zum Tragen durch Spieler, wobei jedes tragbare Datengerät (20) einen Datenspeicher (26) aufweist, der Spielerkontoinformationen des jeweiligen Spielers enthält; einer Schnittstelleneinheit (40), eingebaut in jedem Spielautomaten (10), zur Aufnahme des von einem Spieler getragenen tragbaren Datengeräts (20) und zum Lesen von Spielerinformationen aus dem Datenspeicher (26) dieses tragbaren Datengeräts (20); und einem zentralen Datenverarbeitungssystem (82) zum Aufnehmen des von einem Spieler getragenen tragbaren Datengeräts (20) und zum Auslesen der Spielerinformationen daraus, **dadurch gekennzeichnet**, daß jede Schnittstelleneinheit (40) Einrichtungen zur Datenübertragung von Automatendaten in den Datenspeicher (26) eines darin aufgenommenen tragbaren Datengeräts (20) hat; jedes tragbare Datengerät (20) oder jede Schnittstelleneinheit (40) außerdem einen Prozessor (22 oder 46) zum Speichern von Automatendaten in den Datenspeicher (26) eines tragbaren Datengeräts (20), das in einer Schnittstelleneinheit (40) eines Spielautomaten (10) aufgenommen ist, und zum Modifizieren der in dem Datenspeicher (26) gespeicherten Spielerinformationen in Abhängigkeit von ausgewählten Automatendaten umfaßt, die zu dem tragbaren Datengerät (20) von der Schnittstelleneinheit (40) übertragen werden, in welche es aufgenommen ist, und das zentrale Datenverarbeitungssystem (82) außerdem Einrichtungen zum Lesen von gespeicherten Automatendaten aus einem darin eingesetzten tragbaren Datengerät (20) bietet, die sich auf die Spielautomaten (10) beziehen, mit welchen das tragbare Datengerät (20) benutzt wurde. 55
2. System nach Anspruch 1, wobei jedes tragbare Datengerät (20) einen Prozessor (22) aufweist zum Modifizieren der in den Datenspeicher (26) des tragbaren Datengeräts (20) gespeicherten Spielerinformationen, wenn dieses in einer Schnittstelleneinheit (40) aufgenommen ist, als Antwort auf die ausgewählten Automatendaten, die über die Schnittstelleneinheit (40) zu dem

- tragbaren Datengerät (20) übertragen werden.
3. System nach Anspruch 1, wobei jede Schnittstelleneinheit (40) einen Prozessor (46) aufweist zum Modifizieren der in den Datenspeicher (26) eines darin eingesetzten tragbaren Datengeräts (20) gespeicherten Spielerinformationen als Antwort auf die ausgewählten Automatendaten, die über die Schnittstelleneinheit (40) dem tragbaren Datengerät (20) übertragen werden.
4. System nach Anspruch 1, wobei jedes tragbare Datengerät (20) einen Prozessor (22) und jede Schnittstelleneinheit (40) einen Prozessor (46) aufweist, wobei die Prozessoren (22, 46) zusammenarbeiten, um die in dem Datenspeicher (26) eines in einer Schnittstelleneinheit (40) aufgenommenen tragbaren Datengeräts (20) gespeicherten Spielerinformationen zu modifizieren, als Antwort auf die ausgewählten Automatendaten, die über die Schnittstelleneinheit (40) zu dem tragbaren Datengerät (20) übertragen werden.
5. System nach einem der vorhergehenden Ansprüche, wobei der Datenspeicher (26) ein permanenter RAM-Speicher ist.
6. System nach einem der vorhergehenden Ansprüche, wobei die Schnittstelleneinheiten (40) innerhalb der Außengehäuse der Spielautomaten (10) enthalten sind.
7. System nach einem der vorhergehenden Ansprüche, wobei sowohl die Schnittstelleneinheit (40) als auch das Datengerät (20) Einrichtungen zur Codierung der an das tragbare Datengerät (20) übertragenen Daten sowie Einrichtungen zur Decodierung der von den tragbaren Datengeräten (20) übertragenen Daten aufweisen.
8. System nach einem der vorhergehenden Ansprüche, wobei jede Schnittstelleneinheit (40) Einrichtungen zum Hinzufügen von Datums- und Zeitangaben zu den ausgewählten Daten enthält.
9. System nach einem der vorhergehenden Ansprüche, wobei jede Schnittstelleneinheit (40) zusätzlich ein Anzeigefeld (78) aufweist zum Anzeigen der Spielerinformationen aus einem darin eingesetzten tragbaren Datengerät (20).
10. System nach einem der vorhergehenden Ansprüche, wobei jedes tragbare Datengerät (20) Außenmaße hat, die einer Standardkreditkarte entsprechen.
11. System nach einem der vorhergehenden Ansprüche, wobei jedes tragbare Datengerät (20) einen eigenen Speicher oder Speicherbereich (26) hat, der zum Empfangen von Spielerinformationen, Spielinformationen sowie Automatendaten konfiguriert ist.
12. System nach Anspruch 11, wobei die Spielinformationen Spielerkontoinformationen enthalten einschließlich eigener Bereiche zum Identifizieren, für jede vom Spielautomaten akzeptierte Währungskategorie, der Anzahl der gespielten Spiele, des Betrags jedes Gewinns, der Anzahl der Münzen oder Wertmarken, die in den Spielautomaten eingegeben wurden, während das tragbare Datengerät (20) in ihn eingesetzt ist, und der gespielten Zeit.

Revendications

1. Système de transfert de données destiné à être utilisé avec une pluralité de machines de jeu (10) comportant :
- une pluralité d'unités de données portatives (20) destinées à être portées par des joueurs, chaque unité de données portative (20) comportant une mémoire de données (26) contenant une information de compte joueur concernant son joueur associé ;
 - une interface (40) incorporée à chaque machine de jeu (10) pour recevoir l'unité de données portative (20) portée par un joueur et pour lire depuis la mémoire de données (26) de cette unité de données portative (20) une information joueur ; et
 - un processeur de données central (82) pour recevoir l'unité de données portative (20) portée par un joueur et en lire l'information joueur, caractérisé en ce que
 - chaque interface (40) comprend des moyens pour transmettre des données machine à la mémoire de données (26) d'une unité de données portative (20) reçue dans l'interface,
 - chaque unité de données portative (20) ou chaque interface (40) comprend en outre un processeur (22 ou 46) pour enregistrer des données machine dans la mémoire de données (26) d'une unité de données portable (20) reçue dans une interface (40) d'une machine de jeu (10) et pour modifier une information joueur mémorisée dans ladite mémoire de données (26) en réponse à des données machine sélectionnées transmises à l'unité de données portative (20) par l'interface (40) dans laquelle est reçue ; et
 - le processeur de données central (82) comprend en outre des moyens pour lire à partir

- d'une unité de données portative (20) introduite à l'intérieur des données machine ayant trait aux machines de jeu (10) avec lesquelles l'unité de données portative (20) a été utilisée.
2. Système selon la revendication 1, dans lequel chaque unité de données portative (20) comporte un processeur (22) pour modifier l'information joueur mémorisée dans la mémoire de données (26) de l'unité de données portative (20) lorsqu'elle est reçue dans une interface (40) en réponse aux données machine sélectionnées transmises à l'unité de données portative (20) par l'interface (40).
3. Système selon la revendication 1, dans lequel chaque interface (40) comporte un processeur (46) pour modifier l'information joueur mémorisée dans la mémoire de données (26) d'une unité de données portative (20) introduite à l'intérieur, en réponse aux données machine sélectionnées transmises à l'unité de données portative (20) depuis l'interface (40).
4. Système selon la revendication 1, dans lequel chaque unité de données portative (20) comporte un processeur (22) et chaque interface (40) comporte un processeur (46), les processeurs (22, 46) coopérant pour modifier l'information joueur mémorisée dans la mémoire de données (26) d'une unité de données portative (20) reçue dans une interface (40) en réponse aux données machine sélectionnées transmises à l'unité de données portative (20) par l'interface (40).
5. Système selon l'une quelconque des revendications précédentes, dans lequel la mémoire de données (26) est une mémoire à accès sélectif non volatile.
6. Système selon l'une quelconque des revendications précédentes, dans lequel les interfaces (40) sont comprises à l'intérieur des boîtiers extérieurs des machines de jeu (10).
7. Système selon l'une quelconque des revendications précédentes, dans lequel à la fois les interfaces (40) et l'unité de données (20) comportent des moyens pour crypter des données transmises à l'unité de données portative (20) et des moyens pour déchiffrer des données transmises depuis les unités de données portatives (20).
8. Système selon l'une quelconque des revendications précédentes, dans lequel chaque interface (40) comprend des moyens pour ajouter une information de date et d'heure aux données sélectionnées.
9. Système selon l'une quelconque des revendications précédentes, dans lequel chaque interface (40) comprend en outre un dispositif d'affichage (78) pour visualiser une information joueur provenant d'une unité de données portative (20) introduite à l'intérieur.
10. Système selon l'une quelconque des revendications précédentes, dans lequel chaque unité de données portative (20) possède des dimensions extérieures qui correspondent à une carte de crédit normalisée.
11. Système selon l'une quelconque des revendications précédentes, dans lequel chaque unité de données portative (20) possède une mémoire distincte ou une zone de mémoire (26) configurée pour recevoir une information joueur, une information de jeu et des données machine.
12. Système selon la revendication 11, dans lequel l'information de jeu comprend une information de compte joueur comprenant des champs distincts pour identifier, pour chaque dénomination de monnaie acceptable par la machine de jeu, le nombre de parties jouées, le montant de gains éventuels, le nombre de pièces de monnaie ou de jetons introduits dans la machine de jeu tandis que l'unité de données portative (20) est introduite à l'intérieur et la durée du jeu.

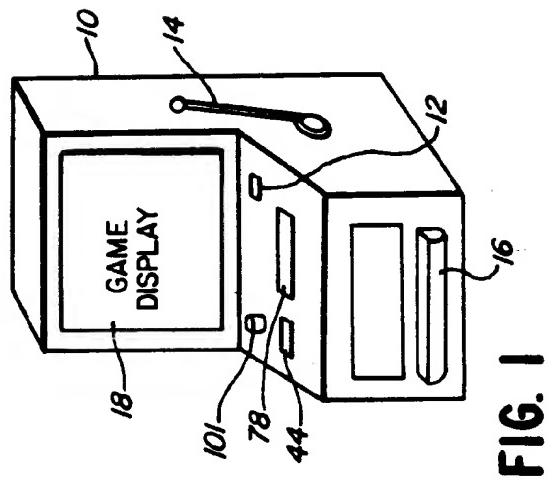


FIG. 1

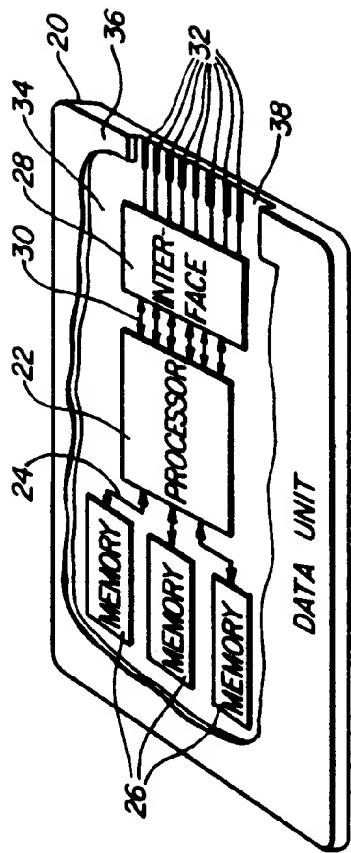


FIG. 2

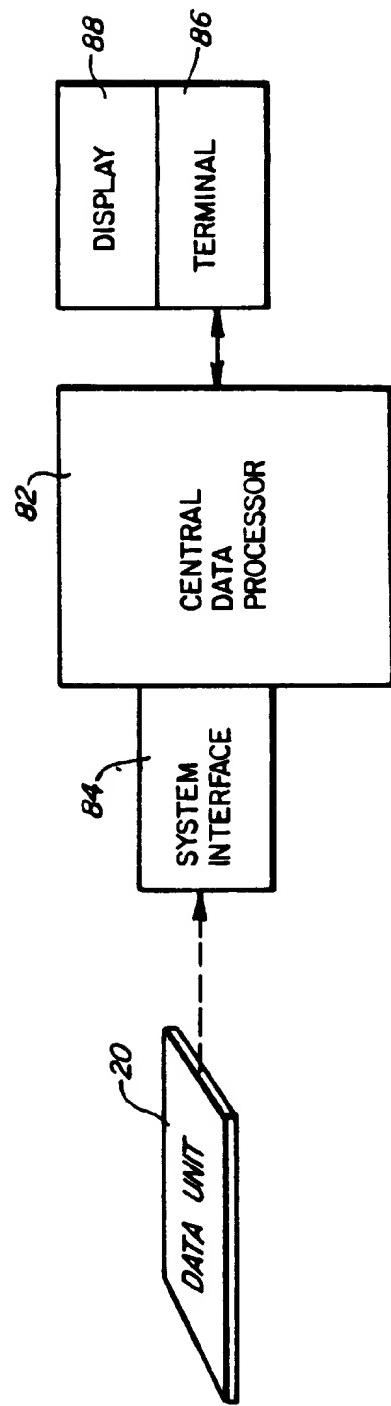
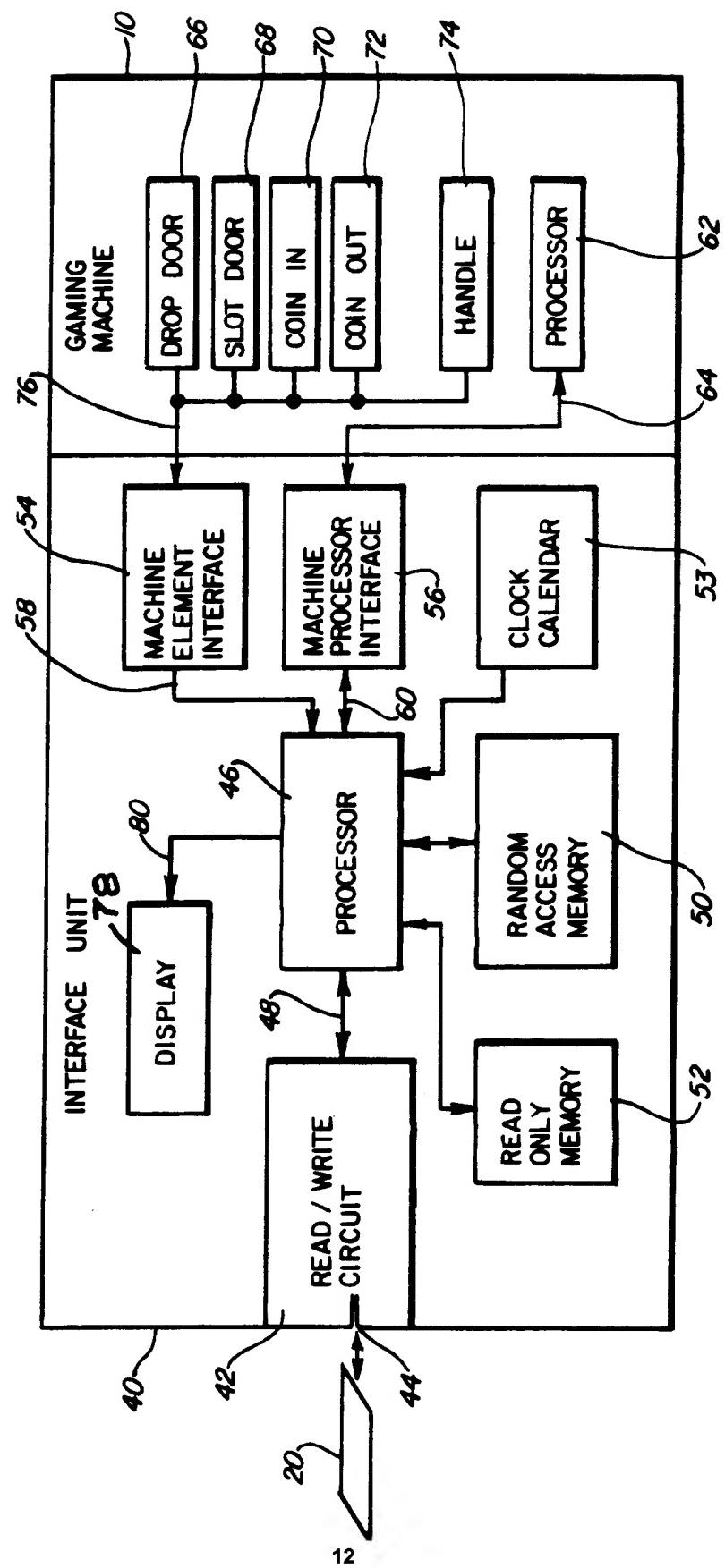


FIG. 4

**FIG. 3**

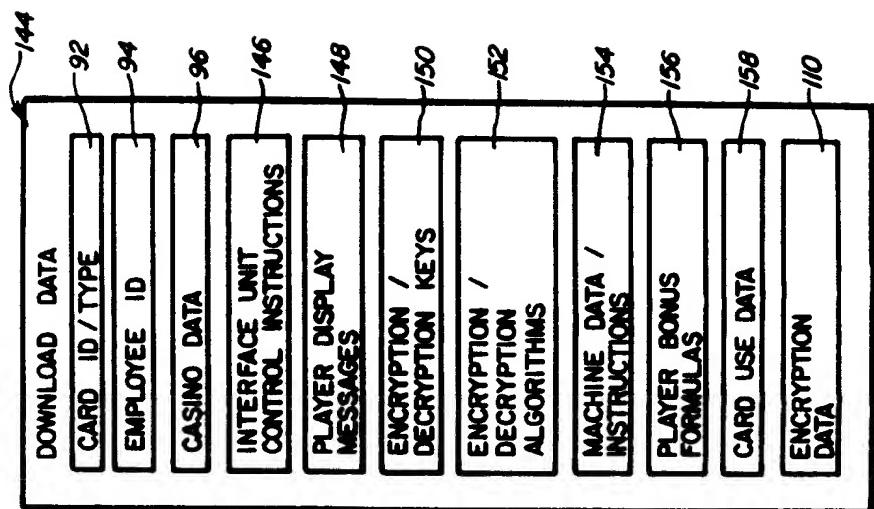


FIG. 7

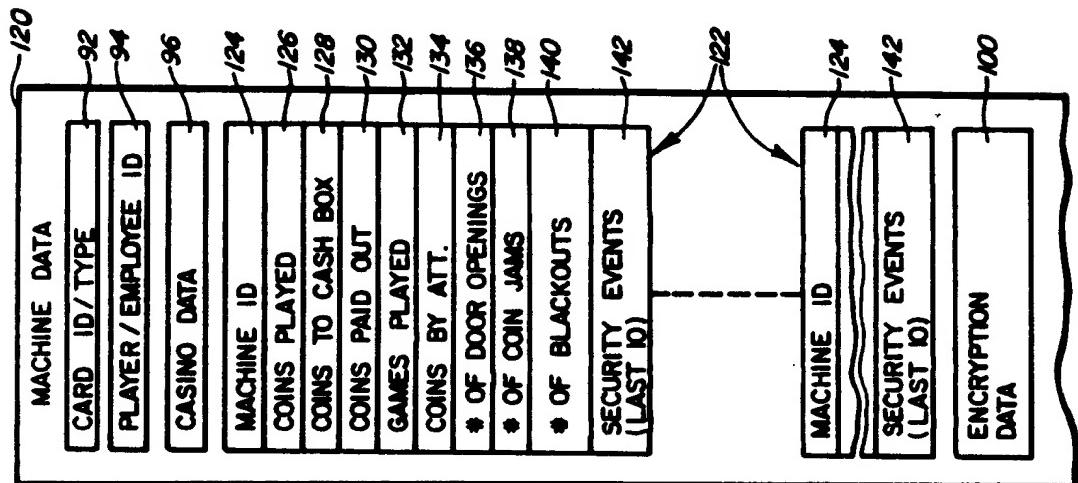


FIG. 6

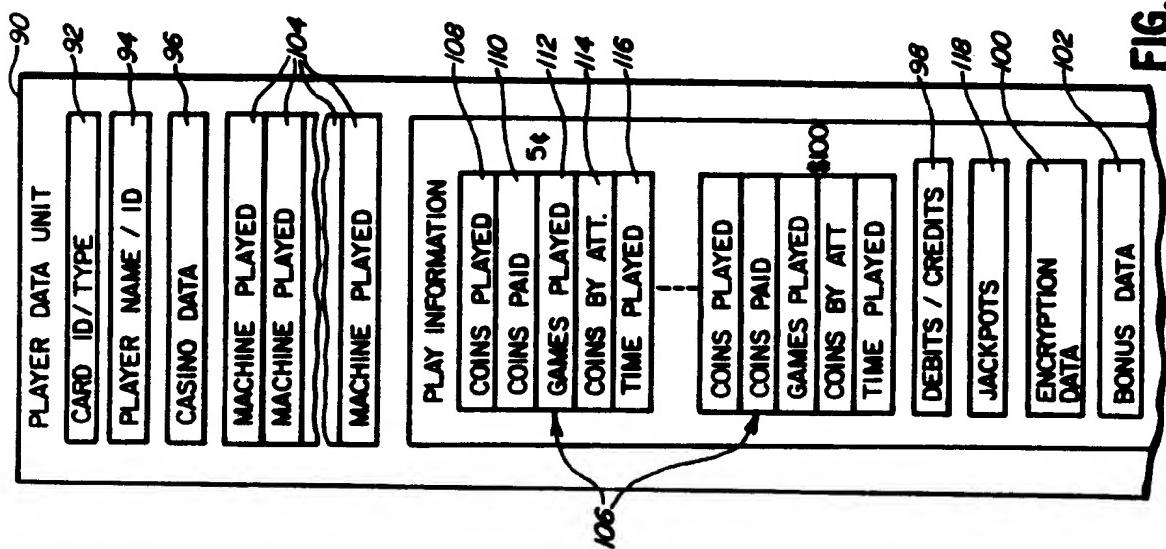


FIG. 5